

NOAA In Your State

Michigan

“NOAA’s science based work touches 300 million Americans daily, protecting lives and livelihoods. NOAA’s products and services are the result of the hard work of our dedicated staff and partner organizations located in program and research offices throughout the globe. The following is a summary of NOAA programs based in, and focused on, your state or territory. The entries are listed by statewide, region, and then by congressional districts and cities or towns.”

Dr. Kathryn Sullivan

Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

MI

Statewide

National Ocean Service (NOS) - [Geodetic Advisor](#)

The Geodetic Advisor is a jointly funded National Ocean Service (NOS) employee that resides in the state to provide liaison between NOS and the host state. The Geodetic Advisor guides and assists the state's charting, geodetic and surveying programs through technical expertise. The program is designed to fill a need for more accurate geodetic surveys, and is in response to the desire of states to improve their surveying techniques to meet Federal Geodetic Control subcommittee standards and specifications. The surveys provide the basis for all forms of mapping and engineering projects and monitoring of the dynamic Earth. This program also provides technical assistance in planning and implementing Geographic/Land Information System (GIS/LIS) projects.

National Ocean Service (NOS) - [National Estuarine Research Reserve System](#)

The NERRS Science Collaborative is a new National Estuarine Research Reserve System (NERRS) program that integrates science into the management of coastal natural resources. Administered through a five-year cooperative agreement with the University of Michigan, the Collaborative will sponsor Reserve-based local science to address the impacts of land use, habitat change, and pollution on coastal environments in a time of climate change. The program will transfer results of this science throughout the national NERR System as well as to the greater coastal management community. The program will use a competitive process to identify, fund, and foster collaborative, place-based science to address local environmental challenges with broad relevance. The program will transfer place-placed science sponsored by the competitive funding component of the program to other Reserve sites and the broader coastal management community.

National Weather Service (NWS) - Automated Surface Observing Systems [Stations](#)

The Automated Surface Observing Systems (ASOS) program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). ASOS serves as the Nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations while supporting the needs of the meteorological, hydrological, and climatological research communities. ASOS works non-stop, observing basic weather elements, such as cloud cover, precipitation, wind, sea level pressure, and conditions, such as rain, snow, freezing rain, thunderstorms, and fog. There are 27 ASOS stations in Michigan.

National Weather Service (NWS) - Cooperative Observer Program [Sites](#)

The National Weather Service (NWS) Cooperative Observer Program (COOP) is truly the Nation's weather and climate observing network of, by and for the people. More than 10,000 volunteers take observations on farms, in urban and suburban areas, National Parks, seashores, and mountaintops. The data are representative of where people live, work and play. The COOP was formally created in 1890 under the NWS Organic Act to provide observational meteorological data, usually consisting of daily maximum and minimum temperatures, snowfall, and 24-hour precipitation totals, required to define the climate of the United States and to help measure long-term climate changes, and to provide observational meteorological data in near real-time to support forecast, warning and other public service programs of the NWS.

The data are also used by other federal (including the Department of Homeland Security), state and local entities, as well as private companies (such as the energy and insurance industries). In some cases, the data are used to make billions of dollars' worth of decisions. For example, the energy sector uses COOP data to calculate the Heating and Cooling Degree Days which are used to determine individuals' energy bills monthly.

There are 265 COOP sites in Michigan.

National Weather Service (NWS) - NOAA Weather Radio All Hazards [Transmitters](#)

NOAA Weather Radio All Hazards (NWR) is a nationwide network of radio stations broadcasting continuous weather information directly from the nearest National Weather Service (NWS) forecast office. NWR broadcasts official NWS warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week. Working with the Federal Communication Commission's (FCC) Emergency Alert System, NWR is an "All Hazards" radio network, making it the single source for comprehensive weather and emergency information. In conjunction with federal, state, and local emergency managers and other public officials, NWR also broadcasts warning and post-event information for all types of hazards – including natural (such as earthquakes or avalanches), environmental (such as chemical releases or oil spills), and public safety (such as AMBER alerts or 911 Telephone outages). Known as the "Voice of NOAA's National Weather Service," NWR is provided as a public service by the NWS. NWR includes 1,100 transmitters covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. There are 28 NWR transmitters in Michigan.

Office of Oceanic and Atmospheric Research (OAR) - [Sea Grant College Program](#)

NOAA's National Sea Grant College Program is a federal-university partnership that integrates research, education and outreach. Sea Grant forms a network of 33 programs in all U.S. coastal and Great Lakes states, Puerto Rico and Guam. Michigan Sea Grant College Program promotes better understanding, conservation and use of Michigan's coastal resources. The program supports research, education and outreach efforts designed to foster science-based decisions about the use and conservation of Great Lakes resources. Michigan Sea Grant is in the heart of one of the most biologically diverse freshwater ecosystems in the world. With more than 3,288 miles of Great Lakes shoreline, 11,000 inland lakes and 36,000 miles of rivers — water is what makes Michigan a special place. The Great Lakes are not just a "local" issue, housing about one-fifth of the world's fresh surface water supply, and nine-tenths of the U.S. supply. A collaborative effort of University of Michigan and Michigan State University, Michigan Sea Grant supports efforts in coastal regions throughout the state. The program was established in 1969 at the University of Michigan.

Great Lakes

National Marine Fisheries Service (NMFS) - [Restoration Center](#)

In the Great Lakes, the Restoration Center focuses on restoring the most degraded environments--designated Areas of Concern—as well as reversing the environmental damages resulting from oil spills, chemical releases, and marine debris. Our projects address loss of habitat and diminished fish and wildlife populations. Since 2008, we have targeted roughly \$87 million to restore more than 6,000 acres of habitat for fish and wildlife, remove over 210,000 metric tons of waste and demolition material, and open more than 780 miles of river for fish passage. NMFS's Restoration Center works with private and public partners in Michigan and nationwide to restore coastal habitat. We provide technical and financial assistance to help recover threatened and endangered species, support sustainably managed species, and reverse the damage done by oil spills and toxic releases. In Michigan, we focus on restoring habitats and implementing projects that specifically lead to the delisting of AOCs. Currently, for example, we are working with local partners on a plan for implementing the Muskegon Lake Habitat Focus Area. We are doing this to focus and prioritize NOAA resources, such as internal programs and expertise, on habitat loss and degradation there. Through the Damage Assessment Remediation and Restoration Program, the Restoration Center also collaborates with other agencies, industry, and citizens to protect and restore coastal and marine resources in Michigan threatened or injured by oil spills, releases of hazardous substances, and vessel groundings.

National Ocean Service (NOS) - [National Water Level Observation Network](#)

The National Ocean Service (NOS) operates 30 long-term continuously operating water level stations in the state of Michigan, which provide data and information on Great Lakes and interconnecting waterways datum and lake level regulation and are capable of producing real-time data for storm surge warning. These stations are located on Lake Michigan at Port Inland, Holland, Ludington, and Menominee; on Lake Huron at Lakeport, Harbor Beach, Essexville, Alpena, Mackinaw City and De Tour Village; on Lake Erie at Fermi Power Plant; on the Detroit River at Gibraltar, Wyandotte, Fort Wayne, and Windmill Point; on the Lake St. Clair and River at St. Clair Shores, Algonac, St. Clair State Police, Dry Dock, Mouth of the Black River, Dunn Paper, and Fort Gratiot; on Lake Superior at Ontonagon, Marquette C.G. and Point Iroquois; and on the St. Mary's River at U.S. Slip, S.W. Pier, West Neebish Island, and Rock Cut.

National Ocean Service (NOS) - [Phytoplankton Monitoring Network](#)

The Phytoplankton Monitoring Network (PMN) engages volunteers in monitoring for marine phytoplankton and HABs. Data collected by PMN volunteers is used to better understand species composition and distribution in coastal and Great Lakes waters, and to identify areas for further research and monitoring. Through this program, we have alerted managers to previously undetected toxins in commercial shellfish beds, and the potential for human Amnesic Shellfish Poisoning and domoic acid toxicity in marine animals. This year PMN is active along the West Coast from CA to AK, in Lake Erie, in the Gulf of Maine, and the Gulf of Mexico.

National Ocean Service (NOS) - [Navigation Manager](#)

NOAA's navigation managers work directly with pilots, port authorities, and recreational boating organizations to help identify the navigational challenges facing marine transportation in Michigan and provide NOAA's resources and services that promote safe and efficient navigation. Navigation managers are on call to provide NOAA navigation response coordination in case of severe coastal weather events or other marine emergencies. The Office of Coast Survey has a navigation manager in Silver Spring, MD to support mariners and stakeholders in the Great Lakes region.

National Ocean Service (NOS) - [Coastal and Estuarine Land Conservation Program](#)

The Coastal and Estuarine Land Conservation Program (CELCP) brings conservation partners together to protect coastal and estuarine lands considered important for their ecological, conservation, recreational, historical, or aesthetic values. To date CELCP has protected more than 100,000 acres of land nationally and awarded three grants in Michigan. The program provides state and local governments with matching funds to purchase significant coastal and estuarine lands, or conservation easements on these important lands that are threatened by development. Lands or conservation easements acquired with CELCP funds are protected in perpetuity so that they may be enjoyed by future generations. CELCP has created an interactive map highlighting information about completed projects in your state.

National Ocean Service (NOS) - [Coastal Storms Program](#)

To find efficiencies and increase effectiveness, the Coastal Storms Program brings a NOAA focus to a specific area to address coastal issues in that region. The program came to the Great Lakes region in 2012 and will continue providing support through 2017. Great Lakes project work is focused on the following priority areas: 1) improved weather observations, modeling, and risk communication to address hazards affecting beach safety (rip currents) and coastal development; 2) Shoreline assessment and management; and 3) stormwater impacts on aquatic resources. As part of the program's weather observation goal, a meteorological and physical data buoy was placed in Lake Michigan, near Port Sheldon, Michigan. Outreach coordinators are located with Minnesota and Wisconsin Sea Grant to help spread the word about the resources available through this effort, and a small grants competition held in FY13 was administered by Ohio Sea Grant.

National Ocean Service (NOS) - [Coastal Management Program](#)

Through a unique Federal-state partnership, NOAA's Office for Coastal Management (OCM) works with the Michigan Department of Environmental Quality to implement the National Coastal Zone Management Program in Michigan. OCM provides the coastal management program with financial and technical assistance to further the goals of the Coastal Zone Management Act and ensure our coastal waters and lands are used in a balanced way to support jobs, reduce use conflicts, and sustain natural resources.

National Ocean Service (NOS) - [Marine Debris Projects and Partnerships](#)

The NOAA Marine Debris Program (MDP) leads national and international efforts to research, prevent, and reduce the impacts of marine debris. The program supports marine debris removal, education and outreach, and research projects in partnership with state and local agencies, tribes, non-governmental organizations, academia, and industry. In Michigan, the MDP is partnering with the Alliance for the Great Lakes to remove 200 tons of large debris items including concrete, metal and other debris from the shoreline of Belle Isle. The project also engages the community through the Belle Isle Nature Zoo and by encouraging participation in shoreline cleanups through the Alliance's Adopt-a-Beach Program.

National Ocean Service (NOS) - [Great Lakes Observing System](#)

The U.S. Integrated Ocean Observing System (IOOS®) is an operational system and a network of regional partners responsible for regional observations, data management, modeling and analysis, education and outreach, and research and development. The overarching purpose of U.S. IOOS is to address regional and national needs for ocean data and information. The Great Lakes Observing System (GLOS) provides public access to critical, real-time and historical data and information about the Great Lakes, St. Lawrence River and interconnecting waterways for use in managing, safeguarding and understanding these immensely valuable freshwater resources. GLOS is intended to gather and integrate chemical, biologic and hydrologic data, and monitor lake conditions and trends over time.

National Weather Service (NWS) - [Michigan Buoys](#)

The National Weather Service (NWS), through its National Data Buoy Center (NDBC), develops, deploys, operates, and maintains the current national data buoy network of moored and drifting weather buoys and land stations that serve all of the Nation's coastal states and territories. Within this network, 110 of the buoys and 51 of the land stations are maintained directly by NDBC. Located at NASA's Stennis Space Center in Mississippi, supports weather and marine warning and forecast services in real time by providing deep ocean and coastal meteorological and oceanographic observations. These data provide valuable information used by NWS supercomputers to produce computer-generated model forecasts of the atmosphere and climate. NDBC manages the Volunteer Observing Ship program to acquire additional meteorological and oceanographic observations supporting NWS mission requirements. NDBC also supports operational and research programs of NOAA and other national and international organizations.

Office of Oceanic and Atmospheric Research (OAR) - [CoastWatch](#)

The CoastWatch node at GLERL provides clients including Federal, state, and local agencies, academic institutions, commercial/industries and the public, both within and outside of the Great Lakes region, with access to near real-time satellite observations and in-situ data for the Great Lakes. CoastWatch data are used in a variety of ways, including near real-time observation and tracking of algal blooms, plumes, ice cover, wind, water intake temperatures at fish hatcheries, two and three-dimensional modeling of Great Lakes physical parameters such as wave height and currents damage assessment modeling, research, and educational and recreational activities.

[MI-1,2,5,10](#)

[Muskegon, Alpena, Saginaw](#)

Office of Oceanic and Atmospheric Research (OAR) - [Real-time Environmental Coastal Observation Network Stations](#)

The goal of the Real-time Environmental Coastal Observation Network (RECON) project is to develop a national network of low cost coastal buoys capable of seabed to sea-surface observations. This wireless Internet observation system, with shore stations at coastal locations covering approximately 800 square miles of sea surface, uses commercially available networking equipment allowing straightforward integration into a nationwide network. The seasonal buoys are located offshore of Muskegon, MI in Lake Michigan, and in Saginaw Bay and Thunderbay, in Lake Huron. The buoys collect meteorological data air data (wind direction, barometric pressure, wind speed, maximum wind speed, air temperature; water near-surface data) and provides lake surface and sub surface measurements of chemical, biological, and physical parameters including water temperature, significant wave height, maximum wave height, dissolved oxygen, and conductivity. The system is designed to allow controlled access to multi-institutional users through surface buoys and sub-surface sensor guest ports located on an underwater hub. The observation network currently provides environmental data to state, federal, and university researchers, educators and resource managers.

[MI-1](#)

[Alpena](#)

National Ocean Service (NOS) - [Great Lakes Bay-Watershed Education Training Program](#)

The NOAA Bay-Watershed Education and Training (B-WET) Program is an environmental education program that promotes locally relevant, experiential learning in the K-12 environment. The primary delivery of B-WET is through competitive funding that promotes Meaningful Watershed Educational Experiences (MWEEs). B-WET currently serves seven areas of the country: California, Chesapeake Bay, Great Lakes, Gulf of Mexico, Hawai'i, New England, and the Pacific Northwest. The Great Lakes B-WET program recognizes that knowledge and commitment built from firsthand experience, especially in the context of one's community and culture, is essential for achieving environmental stewardship. Great Lakes B-WET responds to regional education and environmental priorities through local implementation of competitive grant funds. Please see regional funding opportunity for priorities and eligibility details.

National Ocean Service (NOS) - [Thunder Bay National Marine Sanctuary and Underwater Preserve](#)

The Thunder Bay National Marine Sanctuary in Lake Huron encompasses 4,300 square miles, protecting 92 known historic shipwrecks in Alpena, Alcona and Presque Isle counties, and five shipwrecks from Mackinaw and Cheboygan counties. Protection and management of the sanctuary is entirely focused on Thunder Bay's extraordinary collection of underwater cultural resources (primarily shipwrecks). Dubbed "Shipwreck Alley," historic research indicates that as many as 100 additional shipwrecks may be found in the treacherous waters around Thunder Bay. Intense weather patterns, islands and rocky shoals, and heavy vessel traffic and converging shipping lanes all contributed to the area's vast collection of shipwrecks. These submerged archaeological sites are nearly a complete collection of Great Lakes vessel types from small schooners and pioneer steamboats of the 1830s, to enormous industrial bulk carriers that supported the Midwest's heavy industries during the twentieth century.

Well preserved by Lake Huron's cold, fresh water, the sites are a haven for historians, archaeologists and the public. The sanctuary's waters are important to the local economy as a destination for snorkeling, diving, kayaking. Additionally, NOAA's 20,000 square foot Great Lake Marine Heritage Center brings more than 80,000 visitors to the region annually. Through research, resource protection and education the sanctuary seeks to protect these unique and non-renewable historic sites for future generations.

Office of Oceanic and Atmospheric Research (OAR) - [Science On a Sphere®](#)

Science On a Sphere (SOS) is a room-sized global display system that uses computers and video projectors to display planetary data onto a six foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere which is used to explain complex environmental processes in a way that is simultaneously intuitive and captivating.

Office of Oceanic and Atmospheric Research (OAR) - [Real-Time Meteorological Observation Network](#)

The Marine Instrumentation Laboratory at the Great Lakes Environmental Research Laboratory (GLERL) has deployed and is maintaining a real-time network of meteorological instrument packages including Alpena, MI. The Alpena station measures/records wind speed, max wind speed, wind direction, and air temperature, and wind chill at 2-minute increments updated twice per hour. In addition there is a web cam with four views, images are updated six times per hour, six hour animation loops of these images are also posted.

[Catham](#)

National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)

The U.S. Climate Reference Network (USCRN) is an operationally viable research network of 134 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS).

[Gaylord](#)

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National Weather Service (NWS) - [Weather Forecast Office](#)

Located near Gaylord, this NWS Weather Forecast Office (WFO) is staffed around-the-clock every day, and provides the best possible weather, water, and climate forecasts and warnings to residents of 25 counties in the northern section of Michigan's Lower Peninsula and two counties in the eastern Upper Peninsula, and provides marine forecasts and warnings for near-shore waters of Lake Huron, Lake Michigan and Lake Superior. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards.

Forecasters also provide Impact-based Decision-Support Services (IDSS), both remotely and on-site, during critical emergencies, such as wildfires, floods, chemical spills, and for major recovery efforts such as those following the Joplin and Moore tornadoes, Hurricanes Katrina and Sandy, and the Sept. 11, 2001, terrorist attacks in New York City and Washington D.C. The WFO collects and disseminates precipitation, river, and rainfall data, and prepares local climatological data. Each WFO has a Warning Coordination Meteorologist who actively conducts outreach and educational programs, which helps build strong working relationships with local partners in emergency management, government, the media and academic communities. The WFO operates Automated Surface Observing Stations (ASOS), as well as the local Doppler Weather Radar, which provides critical information about current weather conditions. The radar data enables forecasters to issue warnings for tornadoes, severe thunderstorms, and flash floods.

[Marquette](#)

National Weather Service (NWS) - [Weather Forecast Office](#)

Located in Negaunee Township, this NWS Weather Forecast Office (WFO) is staffed around-the-clock every day, and provides the best possible weather, water, and climate forecasts and warnings to residents of 13 counties in Michigan's Upper Peninsula, and provides marine forecasts and warnings for near-shore waters of Lake Michigan and Lake Superior, and for the open waters of Lake Superior. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards.

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Sault Ste. Marie

National Ocean Service (NOS) - [Soo Locks PORTS®](#)

A Physical Oceanographic Real-Time System (PORTS®) is operated cooperatively with the U.S. Army Corps of Engineers and provides real-time data quality-controlled and disseminated to local users for safe and efficient navigation. Real-time data are available for water levels from seven stations and meteorological data from six locations.

Thunder Bay Island

Office of Oceanic and Atmospheric Research (OAR) - [Real-Time Meteorological Observation Network](#)

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MI-1 through 10

Great Lakes and tributary cities

National Ocean Service (NOS) - [Great Lakes Real-Time Currents Monitoring](#)

The Center for Operational Oceanographic Products and Services (CO-OPS) collects, analyzes, and distributes observations and predictions of currents. The goals are to ensure safe, efficient and environmentally sound maritime commerce, and to support environmental needs such as HAZMAT response. The principal product generated by this program is information used to maintain and update the Tidal Current Tables. There is one real-time current meter operating in Michigan at the St. Clair River.

MI-2

Allendale

Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Institute for Limnology and Ecosystems Research](#)

Established in 2007, the Cooperative Institute for Limnology and Ecosystems Research (CILER) conducts collaborative research through a ten-member consortium of academic institutions in the Great Lakes region. CILER's primary NOAA research partner is the Great Lakes Environmental Research Laboratory; CILER also collaborates with NOAA's Office of Oceanic and Atmospheric Research, National Ocean Service, National Weather Service, and National Environment Satellite, Data, and Information Service. CILER is administratively housed at the University of Michigan, and is comprised of Grand Valley State University, Michigan State University, Ohio State University, Penn State University, State University of New York-Stony Brook, University of Illinois of Urbana-Champaign, University of Michigan, University of Minnesota, University of Toledo, and University of Wisconsin. CILER conducts research across six scientific themes: (1) Great Lakes forecasting; (2) invasive species; (3) observing systems; (4) protection and restoration of resources; (5) integrated assessment; and (6) education and outreach.

Muskegon

Office of Oceanic and Atmospheric Research (OAR), National Marine Fisheries Service (NMFS), National Ocean Service (NOS) - [Habitat Focus Area](#)

Muskegon Lake has been selected as a Habitat Focus Area under NOAA's Habitat Blueprint. Habitat Focus Areas are a non-regulatory, collaborative approach to habitat conservation that NOAA launched in 2013 to increase the effectiveness of NOAA's habitat conservation science and management efforts. Habitat Focus Areas are places where NOAA offices, working together with public and private sector partners, can achieve measurable habitat conservation results in three to five years. The Muskegon Lake watershed has been a center for industrial activity since the late 1800s. To address the impact of this industrial legacy, the Muskegon Lake Habitat Focus Area team has identified a number of objectives they will target over the next five years including addressing loss of fish and wildlife habitat within Muskegon and Bear lakes, rebuilding sport fisheries and populations of aquatic organisms to sustainable levels, and increasing coastal tourism, access and recreation opportunities.

Office of Oceanic and Atmospheric Research (OAR) - [Lake Michigan Field Station](#)

The LMFS is strategically positioned on Lake Michigan to provide support to the local and regional community by further developing NOAA's role in freshwater ecology, ecosystems management, coastal management, and water-based commerce. This field station promotes long-term observations, field work, and process studies essential for understanding and developing future ecological services. The LMFS supports GLERL's Ecosystem Dynamics theme with on-site researchers, laboratory facilities and storage, and direct access to ship resources. The LMFS also provides a base and accommodations for offsite researchers from GLERL and partner agencies. Science at LMFS is primarily focused on field-based long-term observations and field-based shorter-term process studies in Lake Michigan. LMFS is home to vessel operations, which is a critical asset that supports NOAA GLERL science on the Great Lakes. The LMFS provides a base for vessel operations that ensures vessel safety, compliance, maintenance, planning, and effective field operations. The facility has both small boat and deep-water docking capabilities. The physical location of the LMFS promotes partnerships with many other agencies and universities including the US Geological Survey - Great Lakes Science Center, Michigan Dept. of Natural Resources, Purdue University, Michigan Tech Univ., Univ. of Michigan, Little Traverse Bay Bands of Odawa Indians, and the Chippewa Ottawa Resource Authority.

Office of Oceanic and Atmospheric Research (OAR) - [Marine Instrumentation Laboratory](#)

The Marine Instrumentation Laboratory at the Great Lakes Environmental Research Laboratory (GLERL) has deployed and is maintaining a real-time network of shore-based meteorological instrument packages including locations on Lake Michigan. The meteorological observations obtained from the network are being used in GLERL's Great Lakes Coastal Forecasting System to improve nowcasts and forecasts of wind, waves, water levels, ice cover and circulation. The Muskegon station measures wind speed, max wind speed, wind direction, air temperature, dew point, relative humidity, station pressure, sea level pressure, and PAR at 2-minute increments. Additionally there are four Muskegon web cams, images are updated six times per hour.

MI-3

Grand Rapids

National Weather Service - [Weather Forecast Office](#)

Located at the Kent County International Airport in Grand Rapids, this NWS Weather Forecast Office (WFO) is staffed around-the-clock and provides the best possible weather, water, and climate forecasts and warnings to residents of 23 counties in western Michigan and provides marine forecasts and warnings for near-shore waters of Lake Michigan. Forecasters issue warnings for events including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards.

Forecasters also provide Impact-based Decision-Support Services (IDSS), both remotely and on-site, during critical emergencies, such as wildfires, floods, chemical spills, and for major recovery efforts such as those following the Joplin and Moore tornadoes, Hurricanes Katrina and Sandy, and the Sept. 11, 2001, terrorist attacks in New York City and Washington D.C. The WFO collects and disseminates precipitation, river, and rainfall data, and prepares local climatological data. Each WFO has a Warning Coordination Meteorologist who actively conducts outreach and educational programs, which helps build strong working relationships with local partners in emergency management, government, the media and academic communities. The WFO operates Automated Surface Observing Stations (ASOS), as well as the local Doppler Weather Radar, which provides critical information about current weather conditions. The radar data enables forecasters to issue warnings for tornadoes, severe thunderstorms, and flash floods.

MI- 8

Lansing

Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Institute for Limnology and Ecosystems Research](#)

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MI-9

Royal Oak

Office of Oceanic and Atmospheric Research (OAR) - [Science On a Sphere®](#)

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MI-11

White Lake/Metro Detroit

National Weather Service (NWS) - [Weather Forecast Office](#)

Located in White Lake Township, this NWS Weather Service Office (WFO) is staffed around-the-clock every day, and provides the best possible weather, water, and climate forecasts and warnings to residents of southeast Michigan and provides marine forecasts and warnings for near-shore and open waters of Lake Huron. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards.

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MI-12

Ann Arbor

National Ocean Service (NOS) - [Office of Response and Restoration](#)

The Office of Response and Restoration's (OR&R) Regional Resource Coordinator (RRC) based in Ann Arbor provides scientific and technical expertise and timely response to oil spills or hazardous materials releases to collect information, samples, and evidence that are time dependent and critical to support natural resource damage assessments throughout the coastal US. Specifically, RRCs work on multi-disciplinary scientific, economic, and legal teams and are responsible for determining and quantifying injuries to NOAA trust natural resources through determination of injuries and pathway, and demonstration of causal mechanisms. RRCs document the severity, geographic extent, and likely duration of the injury. The goal of the RRCs efforts is to determine the appropriate amount and type of restoration required to restore injured NOAA trust resources and compensate the public for their lost use.

Office of Oceanic and Atmospheric Research (OAR) - [Regional Integrated Sciences and Assessments](#)

The Great Lakes Regional Integrated Sciences and Assessments Center (GLISA) was established as a cooperative agreement between NOAA's Climate Program Office and University of Michigan and Michigan State University. GLISA spotlights three critical sectors in the Great Lakes region—agriculture, watershed management, and natural resources-based recreation and tourism—which are interconnected through issues of water quality and quantity. The two overarching goals of GLISA are to contribute to the long-term sustainability of the region in the face of a changing climate and to improve the utility of scientific knowledge in decision making. Cooperating institutions are University of Michigan, Michigan State University, and The Ohio State University with funding from NOAA's Regional Integrated Sciences and Assessments (RISA) Program.

Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Institute for Limnology and Ecosystems Research](#)

Established in 2007, Cooperative Institute for Limnology and Ecosystems Research (CILER) conducts collaborative research through a ten-member consortium of academic institutions in the Great Lakes region. CILER's primary NOAA research partner is the Great Lakes Environmental Research Laboratory; CILER also collaborates with NOAA's Office of Oceanic and Atmospheric Research, National Ocean Service, National Weather Service, and National Environment Satellite, Data, and Information Service. CILER is administratively housed at the University of Michigan, and is comprised of Grand Valley State University, Michigan State University, Ohio State University, Penn State University, State University of New York-Stony Brook, University of Illinois of Urbana-Champaign, University of Michigan, University of Minnesota, University of Toledo, and University of Wisconsin. CILER conducts research across six scientific themes: (1) Great Lakes forecasting; (2) invasive species; (3) observing systems; (4) protection and restoration of resources; (5) integrated assessment; and (6) education and outreach.

Office of Oceanic and Atmospheric Research (OAR) - [Great Lakes Coastal Forecast System](#)

The Great Lakes Coastal Forecasting System is useful to all users of the Great Lakes coastal waters who require real-time information and forecasts of air and water temperatures, currents, water levels, ice cover, cloud cover, simulated river particular tracks, and waves. Physical processes have a major impact on environmental, chemical, and biological processes and influence many other types of user activities, such as water supply management, waste water management, power plant sitings, shipping, recreational and commercial boating and fishing, shoreline erosion and redistribution of sedimentary material. Planners and managers responsible for any part of the Great Lakes ecosystem that is affected by lake circulation, such as transport of toxic material or nutrient enrichment processes have full access to the information provided by Great Lakes Coastal Forecast System (GLCFS web site) to assist them in the decision making process.

Office of Oceanic and Atmospheric Research (OAR) - [Great Lakes Environmental Research Laboratory](#)

GLERL is a federal research laboratory that provides coastal constituents and federal, state, and international decision- and policy-makers with scientific understanding of natural hazards such as severe waves, storm surges, and ice; harmful algal blooms; ecosystem and food web interactions including threat and impact of aquatic invasive species; changes in lake water levels; and regional effects related to global climate change. GLERL science helps protect life and property, economic well-being, and sustained ecosystem health of the Great Lakes and other U.S. coastal ecosystems. The Great Lakes contain 20% of the Earth's surface fresh water supply and 90% of the U.S. surface fresh water supply.

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National Ocean Service (NOS) - [Centers of Excellence](#)

The Center of Excellence for Great Lakes and Human Health (CEGLHH) focuses on understanding the inter-relationships between the Great Lakes ecosystem, water quality and human health. The Center employs a multidisciplinary approach to understand and forecast coastal-related human health impacts for natural resource and public policy decision-making, and develop tools to reduce human health risks associated with three research priority areas: beach closures, harmful algal blooms, and drinking water quality.

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